

We claim:

1. A semiconductor laser device including:

- 2. (a) a first oxide layer defining a first aperture;
- 3. (b) a second oxide layer defining a second aperture; and
- 4. (c) an active region located between the apertures;

5. the apertures being of sizes and distances from a center of the active region to induce  
6. a near-Gaussian shape of spatial current density distribution.

1. 2. The laser device according to claim 1, having a p-mirror on one side of the  
2. active region and an n-mirror on another side of the active region, and wherein the first oxide  
3. layer is p-mirror oxide layer and the second oxide layer is an n-mirror oxide layer.

1. 3. The laser device according to claim 2, wherein the first and second oxide  
2. layers and the first and second apertures defined differ in distance from the center of the  
3. active region.

1. 4. The laser device according to claim 2, wherein the size of the first aperture is  
2. smaller than the size of the second aperture.

1. 5. The laser device according to claim 3, wherein the size of the first aperture is  
2. smaller than the size of the second aperture.

1. 6. The laser device according to claim 3, wherein each of the mirrors comprise  
2. stacks of mirror pairs, the first aperture is spaced at substantially three to twenty mirror pairs  
3. from the active region and the second aperture is spaced at substantially one to four mirror  
4. pairs from the active region.

1. 7. The laser device according to claim 4, wherein each of the mirrors comprises  
2. stacks of mirror pairs, the first aperture is spaced at substantially three to twenty mirror pairs  
3. from the active region and the second aperture is spaced at substantially one to four mirror  
4. pairs from the active region.

1. 8. The laser device according to claim 3, wherein the first aperture is  
2. substantially 3 to 20 $\mu$ m across and the second aperture is substantially 5 to 30 $\mu$ m across.

1        9.        The laser device according to claim 4, wherein the first aperture is  
2 substantially 3 to 20 $\mu$ m across and the second aperture is substantially 5 to 30 $\mu$ m across.

3        10.       The laser device according to claim 7, wherein the first aperture is  
4 substantially 3 to 20 $\mu$ m across and the second aperture is substantially 5 to 30 $\mu$ m across.

1        11.       In a VCSEL having an active region, a first stack of mirror pairs on one side  
2 of the active region and a second stack of mirror pairs on a second side of the active region;  
3 the improvement comprising a first oxide aperture of a first size on the one side of the active  
4 region at a first distance from a center of the active region and a second oxide aperture of a  
5 second size on the second side of the active region at a second distance from the center of the  
6 active region.

1        12.       The VCSEL according to claim 11, wherein the first aperture size differs from  
2 the second aperture size and the first distance differs from the second distance.

1        13.       The VCSEL according to claim 12, wherein the first aperture size is smaller  
2 than the second aperture size and the first distance is greater than the second distance.

1        14.       The VCSEL according to claim 13, wherein the first aperture size is  
2 substantially 5 to 30 $\mu$ m across, the first distance is substantially 3 to 20 mirror pairs along the  
3 first mirror pair stack and the second distance is substantially one to four mirror pairs along  
4 the second mirror stack.

1        15.       The VCSEL according to claim 11, further including a substrate upon which  
2 the active region and first and second mirror stacks are grown, a via into the substrate and  
3 into proximity with one of said mirror stacks, heat conductive plating extending from an  
4 outer surface into the via.

1        16.       The VCSEL according to claim 14, further including a substrate upon which  
2 the active region and first and second mirror stacks are grown, a via into the substrate and  
3 into proximity with one of said mirror stacks, heat conductive plating extending from an  
4 outer surface into the via.

1        17.       The VCSEL according to claim 11, further comprising a heat sink supporting  
2 the active region and the first and second mirror stacks, said heat sink extending into heat  
3 conducting relation to one of the mirror stacks.

1           18. The VCSEL according to claim 13, further comprising a heat sink supporting  
2 the active region and the first and second mirror stacks, said heat sink extending into heat  
3 conducting relation to one of the mirror stacks.